

15A NCAC 02D .0933 PETROLEUM LIQUID STORAGE IN EXTERNAL FLOATING ROOF TANKS

(a) For the purpose of this Rule, the following definitions shall apply:

- (1) "Condensate" means hydrocarbon liquid separated from natural gas that condenses due to changes in the temperature or pressure and remains liquid at standard conditions.
- (2) "Crude oil" means a naturally occurring mixture consisting of hydrocarbons or sulfur, nitrogen or oxygen derivatives of hydrocarbons or mixtures thereof that is a liquid in the reservoir at standard conditions.
- (3) "Custody transfer" means the transfer of produced crude oil or condensate, after processing or treating in the producing operations, from storage tanks or automatic transfer facilities to pipelines or any other forms of transportation.
- (4) "External floating roof" means a storage vessel cover in an open top tank consisting of a double deck or pontoon single deck that rests upon and is supported by the petroleum liquid being contained and is equipped with a closure seal or seals to close the space between the roof edge and tank shell.
- (5) "Internal floating roof" means a cover or roof in a fixed roof tank that rests upon or is floated upon the petroleum liquid being contained, and is equipped with a closure seal or seals to close the space between the roof edge and tank shell.
- (6) "Liquid-mounted seal" means a primary seal mounted so the bottom of the seal covers the liquid surface between the tank shell and the floating roof.
- (7) "Petroleum liquids" means crude oil, condensate, and any finished or intermediate products manufactured or extracted in a petroleum refinery.
- (8) "Vapor-mounted seal" means a primary seal mounted so there is an annular vapor space underneath the seal. The annular vapor space is bounded by the bottom of the primary seal, the tank shell, the liquid surface, and the floating roof.

(b) This Rule applies to all external floating roof tanks with capacities greater than 950 barrels containing petroleum liquids whose true vapor pressure exceed 1.52 pounds per square inch absolute.

(c) This Rule does not apply to petroleum liquid storage vessels:

- (1) that have external floating roofs that have capacities less than 10,000 barrels and that are used to store produced crude oil and condensate prior to custody transfer;
- (2) that have external floating roofs and that store waxy, heavy-pour crudes;
- (3) that have external floating roofs, and that contain a petroleum liquid with a true vapor pressure less than 4.0 pounds per square inch absolute; and:
 - (A) the tanks are of welded construction; and
 - (B) the primary seal is a metallic-type shoe seal, a liquid-mounted foam seal, a liquid-mounted filled type seal, or any other closure device of demonstrated equivalence; or
- (4) that have fixed roofs with or without internal floating roofs.

(d) With the exceptions stated in Paragraph (c) of this Rule, an external floating roof tank subject to this Rule shall not be used unless:

- (1) The tank has:
 - (A) a continuous secondary seal extending from the floating roof to the tank wall, known as a rim-mounted secondary seal;
 - (B) a metallic-type shoe primary seal and a secondary seal from the top of the shoe seal to the tank wall, known as a shoe-mounted secondary seal; or
 - (C) a closure or other control device demonstrated to have an efficiency equal to or greater than that required under Part (A) or (B) of this Subparagraph;
- (2) The seal closure devices meet the following requirements:
 - (A) There shall be no visible holes, tears, or other openings in the seal or seal fabric;
 - (B) The seal shall be intact and uniformly in place around the circumference of the floating roof between the floating roof and the tank wall; and
 - (C) For vapor mounted primary seals, any gaps exceeding 0.125 inch in width between the secondary seal and the tank wall shall not exceed 1.0 square inch per foot of tank diameter;
- (3) All openings in the external floating roof, except for automatic bleeder vents, rim space vents, and leg sleeves, are:
 - (A) provided with a projection below the liquid surface; and

- (B) equipped with covers, seals, or lids that remain in a closed position at all times except when in actual use;
- (4) Automatic bleeder vents are closed at all times except when the roof is floated off or landed on the roof leg supports;
- (5) Rim vents are set to open only when the roof is being floated off the roof leg supports or at the manufacturer's recommended setting;
- (6) Any emergency roof drains are provided with slotted membrane fabric covers or equivalent covers that cover at least 90 percent of the area at the opening;
- (7) Planned routine visual inspections to verify the conditions of the seal are conducted once per month;
- (8) For tanks equipped with a vapor-mounted primary seal, the secondary seal gap measurements are made annually in accordance with Paragraph (e) of this Rule; and
- (9) Records are maintained pursuant to 15A NCAC 02D .0903, including:
 - (A) reports of the results of inspections conducted under Subparagraphs (7) and (8) of this Paragraph;
 - (B) a record of the average monthly storage temperature and the true vapor pressures or Reid vapor pressures of the petroleum liquids stored; and
 - (C) records of the throughput quantities and types of petroleum liquids for each storage vessel.

(e) The secondary seal gap area shall be determined by measuring the length and width of the gaps around the entire circumference of the secondary seal. Only gaps equal to or greater than 0.125 inch shall be used in computing the gap area. The area of the gaps shall be accumulated to determine compliance with Part (d)(2)(C) of this Rule.

(f) The owner or operator of a petroleum liquid storage vessel with an external floating roof that is not equipped with a secondary seal or approved alternative and contains a petroleum liquid with a true vapor pressure greater than 1.0 pound per square inch shall maintain records of the average monthly storage temperature, the type of liquid, throughput quantities, and the maximum true vapor pressure for all petroleum liquids with a true vapor pressure greater than 1.0 pound per square inch.

History Note: Authority G.S. 143-215.3(a)(1); 143-215.107(a)(5);
Eff. July 1, 1980;
Amended Eff. June 1, 2004; July 1, 1994; March 1, 1991; December 1, 1989; January 1, 1985;
Readopted Eff. November 1, 2020.